

Discussion of Amendments

The applicants have amended Claims 1 and 14 to narrow the definition of the inorganic acid to "a non-water soluble inorganic acid." Basis for this amendment is contained on page 15, lines 9 - 14. As Claim 11 was merely objected to as being dependent upon a rejected base claim, the applicants have rewritten Claim 11 in independent form, including the limitations of the base claim. Claim 22 was rejected for the same reason as Claim 11 and it has also been rewritten in independent form, including all of the limitations of the base claim. New Claims 24 - 30 have been added. These claims correspond to dependent Claims 2 - 8 depending on allowed Claim 17. As Claim 17 has been allowed, new Claims 24 - 30, which depend on allowed Claim 17, should also be allowable.

No new subject matter is introduced by any of these amendments to the claims or by the introduction of new claims.

Analysis

In a second, non-final Office Action, the United States Patent and Trademark Office rejected Claims 1 - 8, 10, 12 - 14, 19, 20 and 23 under 35 USC § 102(e) as being anticipated by Toshihiko, et al., U.S. Patent No. 6,660,240. In addition, the USPTO rejected Claims 1 - 8, 10, 12 - 14, 19, 20 and 23 under 35 USC § 103 as being unpatentable over Deeba, et. al., U.S. Patent No. 6,093,378 in view of Toshihiko, et. al. Notwithstanding these rejections, the USPTO allowed Claims 17, 18 and 21 and stated that Claims 11 and 22 were merely objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form. The applicants wish to thank the Examiner for the allowance of claims and the indication that certain additional claims would be allowable, if amended.

The applicants have discovered a new filter system for absorbing contaminants from a molten carbonate fuel cell, wherein the filter system includes a filter substrate, an inorganic absorbent secured to the filter substrate by an inorganic binder and an acidic material coated onto the filter substrate, wherein the acidic material comprises an inorganic acid, preferably not a water soluble acid, such as sulfuric or a hydrochloric acid, and most preferably a heterophosphoric acid or a polyphosphoric acid, such as phosphomolybdic acid or phosphotungstic acid.

Analysis of Toshihiko, et. al.

The USPTO rejected certain claims of the application based on Toshihiko, et. al., which disclose "...a gas processing agent for removing carbon monoxide, hydrogen, carbon dioxide and water vapor in a gas...." (Abstract.) It is preferably formed by preparing a precursor noble metal slurry, coating the slurry onto an inorganic porous material using a binder, and then calcining the coated product. A water soluble organic acid, such as acetic acid or an inorganic acid, such as nitric acid, can be used as an additive agent to assist in the binding of the noble metal slurry to the inorganic porous material.

The USPTO acknowledges that Toshihiko, et al. do not disclose a filter system for adsorbing contaminants from a molten carbonate fuel cell exhaust stream. (Page 3.) The adsorbent of the invention is specifically designed to adsorb various alkali carbonates from a molten carbonate fuel cell system. (See page 11, line 25 through page 12, line 11 of the application.) The USPTO asserts that the patentability of a product is independent of how it is made or used. While acknowledging that this statement is generally correct, the applicants respectfully assert that no person skilled in the art looking for a product for filtering alkali carbonates from a molten carbonate fuel cell exhaust stream would look to the invention of Toshihiko, et. al., as there is no teaching in Toshihiko, et. al., that the product manufactured and disclosed by the process of Toshihiko, et. al., would be useful to absorb

alkali carbonate contaminants from a molten carbonate fuel cell exhaust stream.

While the applicants believe that the invention, as disclosed in the claims, as originally filed, is not disclosed by Toshihiko, et. al., in order to advance the prosecution of this application, they have amended Claims 1 and 14 to narrow the description of the acidic materials that are utilized as a coating for the filter substrate. The claims, currently before the USPTO, describe an acidic material comprising an inorganic acid. By the amendments to Claims 1 and 14, this language has been amended to limit the acidic material to "a non-water soluble" inorganic acid. (Basis for this amendment is contained on page 15, lines 9-14.)

Not only is there no disclosure of the utilization of a "non-water soluble" inorganic acid in Toshihiko, et. al., but the disclosure of Toshihiko, et. al., teaches away from the use of this type of acid. The two specific acids that are disclosed by Toshihiko, et. al. are "acetic acid" and "nitric acid," (Col. 4, lines 27-28), both of which are well recognized as being infinitely soluble in water. Further, every Example which utilizes acid utilizes a water soluble acid i.e. acetic acid. (See Embodiments 1, 5, 6, 13 and Comparative Example 3). In addition, in order to make the slurry that is used with the noble metal catalyst precursor of Toshihiko, et. al., the components are always mixed in water. (See Col. 4, lines 10-14 and each Example.)

The water soluble acids of Toshihiko, et. al. are used as "additive agents" to assist the binding of the noble metal material to the inorganic porous material. Obviously, the acid would be of no assistance in binding the noble metal material to the inorganic porous material in an aqueous solution if it was not water soluble!

In contrast, it is important in the process of the manufacture of the product of the invention that the acid utilized not be water soluble. As stated in the application,

In addition, because the exhaust stream from the MCFC also contains high levels of moisture, in a preferred embodiment the acid utilized is preferably not a water soluble acid,... (Page 15, lines 9-12.)

Accordingly, by this amendment the applicants have distinguished the composition of the invention from the composition that is disclosed by Toshihiko, et. al.

Analysis of Deeba, et. al., in view of Toshihiko, et al.

The addition of Deeba, et. al., to the disclosure of Toshihiko, et. al., does not add to the teaching of Toshihiko, et. al., with regard to the composition of the acidic material. This is made clear by the acknowledgment of the Examiner that "Deeba, et. al., do not teach [that] the acidic material comprises an inorganic acid." (Office Action Page 5, line 16.)

Based on this amendment to Claims 1 and 14, the applicants assert that independent Claims 1 and 14 and all of the claims which depend on those claims are allowable over Toshihiko, et. al., alone or in combination with Deeba, et. al.

Analysis of Claim 23

The applicants also assert that previously asserted Claim 23 is allowable over the prior art. Claim 23 discloses a filter system for use in a molten carbonate fuel cell "consisting essentially of" (1) a filter substrate, (2) an inorganic adsorbent secured to the filter substrate by an inorganic binder, and (3) an acidic material coated onto the filter substrate. Both Toshihiko, et. al., and Deeba, et. al., require a number of additional components which are not required by Claim 23. For example, in Toshihiko, et. al. the slurry that is incorporated onto the inorganic material requires inclusion of a noble metal material. Such a noble metal material is not required by Claim 23. Deeba, et. al., require the presence of at least two zeolite components including a second zeolite component comprising a zeolite, and a precious metal component. (See Col. 10, lines 38-40, each of the examples and each claim). In addition, Deeba, et. al., require "at least one first precious metal component in addition to the first and second zeolite components." (Col. 11, lines 65-67, Col. 12, line 44 through Col. 13, line 32 and Col. 14, lines 17-30, as well as the examples and the claims.) As none of these required components of the composition of Deeba, et. al., are elements claimed in Claim 23, the applicants respectfully assert that Deeba, et. al., do not disclose Claim 23.

For all of these reasons the applicants assert that Claim

23 is allowable over the cited prior art.

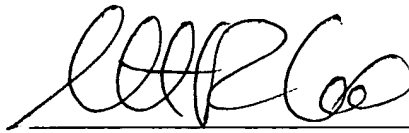
Reservation of Rights

The applicants respectfully and specifically reserve the right to file a divisional application claiming the same subject matter as was originally claimed in Claims 1 and 14 and the dependent claims depending thereon, as well as the amended claims which are included in an amendment filed with the United States Patent and Trademark Office dated August 3, 2004.

CONCLUSION

The applicants requests that all claims, as amended, as well as new Claims 24 - 30, be allowed. If there are any questions concerning this Amendment, please contact applicants' counsel.

Respectfully submitted,



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CERTIFICATE OF SERVICE

I hereby certify that this correspondence is being deposited with the United States Postal Service in an envelope addressed to Mail Stop Amendment, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

Dated: December 21, 2004 W. J. Hart

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